IBM App Connect Enterprise 12 Application Development I

WM686 (Classroom)
ZM686 (Self-paced)

Course description

In this course, you learn how to construct message flow applications to transport and transform data. You learn how to process file data and develop REST APIs. The course also explores how to control the flow of data by using various processing nodes, and how to import, build, and test message flow applications. You learn how to test your message flows by using the Flow Exerciser, Message Flow Debugger, and Trace nodes.

For information about other related courses, see the IBM Training website:

ibm.com/training

General information

Delivery method

Classroom or self-paced virtual classroom (SPVC)

Course level

ERC 1.0

Product and version

IBM App Connect Enterprise 12.0.4.0

Audience

This course is designed for experienced integration specialists and senior-level developers with experience in application development and messaging middleware applications interested in becoming an IBM App Connect Enterprise Developer.

Learning objectives

After completing this course, you should be able to:
- Describe the features and uses of IBM App Connect Enterprise
- Develop, deploy, and test message flow applications
- Generate message flow applications from predefined patterns
- Describe the function and appropriate use of IBM App Connect Enterprise processing nodes
- Use the IBM App Connect Enterprise web user interface to monitor an integration server and a message flow
- Add flow control to a message flow application
- Create reusable subflows
- Process file data in message flows
- Test message flows by using the message flow debugger
- Develop and test REST APIs

Prerequisites

- A familiarity with the Eclipse development environment
- A basic understanding of transport protocols such as Structured Query Language (SQL) Extensible Markup Language (XML), Java, and XML Path Language (XPath)

Duration

2 days

Skill level

Intermediate

Notes

The following unit and exercise durations are estimates, and might not reflect every class experience. If the course is customized or abbreviated, the duration of unchanged units will probably increase.

This course is an update of the following course:
- WM668: IBM App Connect Enterprise V11 Application Development

Course agenda

Course introduction
Duration: 15 minutes

Unit 1. Introduction to IBM App Connect Enterprise
Duration: 1 hour

Overview	This unit introduces IBM App Connect Enterprise, including its components, functions, and business value.
Learning objectives	After completing this unit, you should be able to: • Describe the features and functions of IBM App Connect Enterprise • Describe the business value of IBM App Connect Enterprise • Describe the IBM App Connect architecture and components • Identify the IBM App Connect editions

Unit 2. Application development fundamentals
Duration: 1 hour and 30 minutes

Overview	This unit describes the IBM App Connect components and how they work together. You also learn how to import and export resources into the IBM App Connect development environment, view the message processing node properties, and test the message flow by using the IBM App Connect Flow exerciser.
Learning objectives	After completing this unit, you should be able to: • Describe the high-level architecture of IBM App Connect Enterprise • Explain how to use patterns as a starting point for developing message flow applications • Describe how to import resources to and export resources from the IBM App Connect Enterprise Toolkit • Describe how to use the IBM App Connect Enterprise Toolkit Flow exerciser to test a message flow application • Explain how to use the IBM App Connect Enterprise Toolkit to check the status of the integration server and message flow application

Exercise 1. Importing and testing a message flow
Duration: 1 hour

Overview	This exercise introduces you to the IBM App Connect development environment. To become familiar with the IBM App Connect Enterprise Toolkit views and navigator, you import a simple message flow project and examine the message flow components and properties. You also use the IBM App Connect Enterprise Toolkit Flow exerciser to test the message flow. Before importing the message flow, you create and start an integration server.
Learning objectives	After completing this exercise, you should be able to: • Create and start an integration server • Import an IBM App Connect Enterprise project interchange file • Use the Message Flow editor to examine the message flow components and properties • Test the message flow by using the IBM App Connect Enterprise Toolkit Flow exerciser

Unit 3. Creating message flow applications
Duration: 2 hours

Overview	In this unit, you learn how to manually define an IBM App Connect Enterprise application. You learn how to add and connect message flow nodes, define message flow node properties, and test the message flow application. You also learn how to use the IBM App Connect Enterprise web user interface to monitor an integration server and a message flow application at run time.
Learning objectives	After completing this unit, you should be able to: • Describe how IBM App Connect does basic message processing • Describe the components of a message flow application and message processing nodes • Describe the basic structure of a logical message tree • Explain how to create a message flow application • Explain how to add nodes to a message flow • Describe how to use the IBM App Connect Enterprise web user interface to monitor an integration server and a message flow

Exercise 2. Create a message flow application
Duration: 1 hour

Overview	In this exercise, you create a simple message flow application, and use the IBM App Connect Enterprise Flow Exerciser to test it. You also use the IBM App Connect Enterprise web user interface to check the status of the integration server and message flow application at run time.
Learning objectives	After completing this exercise, you should be able to: • Create a message flow application • Use the IBM App Connect Enterprise Flow Exerciser to test the message flow application • Use the IBM App Connect Enterprise web user interface to check the status of an integration server and message flow application

Unit 4. Controlling the flow of messages
Duration: 1 hour

Overview	In this unit, you learn about message processing nodes that are used to control the flow of a message.
Learning objectives	After completing this unit, you should be able to: • Describe logical messages and the message assembly and explain how they are used in IBM App Connect Enterprise application programming • Use the Filter and Route message processing nodes to examine the contents of a message and alter its flow • Use the RouteToLabel and Label nodes to dynamically change the routing of messages • Use the FlowOrder node to control the flow path order in which a message is processed through a message flow • Create reusable subflows

Exercise 3. Adding flow control to a message flow application
Duration: 1 hour

Overview	In this exercise, a message flow that routes files that contain information about a store by using a Route node within the message flow to route content to one of three stores based on the data received.
Learning objectives	After completing this exercise, you should be able to: • Use the Route node to control message processing • Use the XPath Expression Builder to define a filter pattern • Create custom output terminals on the Route node • Connect a Failure terminal to an output node to capture exceptions • Test the message flow by importing messages into the IBM App Connect Enterprise Toolkit Flow exerciser

Unit 5. Processing file data
Duration: 1 hour

Overview	In this unit, you learn how to use IBM App Connect to process file data.
Learning objectives	After completing this unit, you should be able to: • Describe the file processing nodes • Describe the record detection options for splitting files into multiple records • Use a file as a message flow source and target • Include file input and output nodes that use File Transfer Protocol (FTP) and secure FTP (SFTP) to transfer data

Exercise 4. Processing file data
Duration: 1 hour

Overview	This exercise involves a simple message flow that parses a whole input XML file by using a FileInput node and propagates all of the data as a single propagation downstream through the flow. A Mapping node transforms the XML format data to a comma separated output format and writes it to an output file name and directory, by using a FileOutput node.
Learning objectives	After completing this exercise, you should be able to: • Configure the FileInput to read an XML file • Configure the FileOutput node so that each XML file is processed as a separate transaction • Map XML parameters to field values in a CSV file by using a Mapping node

Unit 6. Developing integration solutions by using a REST API
Duration: 1 hour

Overview	In this unit, you learn how to implement a REST API and how to implement REST operations as subflows. You are also introduced to the OpenAPI Editor.
Learning objectives	After completing this unit, you should be able to: • List two ways to create a REST API in IBM App Connect Enterprise • Describe how to implement REST operations as subflows • Explain the OpenAPI 3.0 specification • Describe how to use the OpenAPI Editor to graphically create a REST API • List the steps to publish a REST API to IBM API Connect • Describe how to invoke a REST API by using the RESTRequest node • Describe the types and benefits of subflows

Exercise 5. Developing a REST API
Duration: 1 hour

Overview	This exercise introduces you to the OpenAPI Editor in IBM App Connect Enterprise. In App Connect Enterprise, you can create a REST API either from scratch or by importing a swagger document. Once you develop the REST API, you can test it by using the web user interface.
Learning objectives	After completing this exercise, you should be able to: • Develop a REST API based on an imported OpenAPI v3.0 specification document • Use the OpenAPI editor to edit the API • Create a subflow that implements a REST operation • Test a REST API by using the web user interface Try it capability • Test a REST API by using the Flow Exerciser

Exercise 6. Invoking a REST API
Duration: 1 hour

Overview	In this exercise, you build a message flow that uses a REST Request node to invoke the REST API you built in Exercise 5 and then you leverage the TEST_SERVER configured. You use the same OpenAPI v3 document as the original back-end REST API uses to configure the node. You also test the REST Request node through a series of cURL commands and the IBM App Connect Enterprise Toolkit Flow exerciser.
Learning objectives	After completing this exercise, you should be able to: • Configure a REST Request node with an OpenAPI v3.0 document • Invoke a REST API by using a REST Request node • Test the REST Request with cURL commands

Unit 7. Testing message flows
Duration: 1 hour

Overview	In this unit, you learn various methods for testing and troubleshooting message flows. App Connect Enterprise, being built on Eclipse, offers a debugger utility to debug your message flows. Trace nodes can also be used to aid in collecting data about the message flow. You also learn how to use the ExceptionList.
Learning objectives	After completing this unit, you should be able to: • Understand integration testing • Understand integration testing List the steps to create a JUnit test project • Explain how to create test cases • Describe the Test client • Describe how to configure a Trace node • Describe how to use the Flow debugger to step through a message flow application • Understand how to use the ExceptionList

Exercise 7. Testing message flows
Duration: 2 hours

Overview	In this exercise, you use the Message Flow Debugger to debug ESQL code in a Compute node. The purpose of this exercise is to provide an opportunity to use the Message Flow Debugger. Although the Compute node and ESQL coding are not covered in this course, the exercise provides instructions on how to use the Debugger to create breakpoints and step through code.
Learning objectives	After completing this exercise, you should be able to: • Debug ESQL code in a Compute node by using the Message Flow Debugger. • Build a JUnit test project and create two test cases. • Add a Trace node to a message flow application

Unit 8. Course summary
Duration: 15 minutes

Overview	This unit summarizes the course and provides information for future study.
Learning objectives	After completing this unit, you should be able to: • Explain how the course met its learning objectives • Access the IBM Training website • Identify other IBM Training courses that are related to this topic • Locate appropriate resources for further study

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